UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/989,913	11/20/2001	Theresa M. Buckley	BUC1073C2	2206

22428 7590 06/26/2003

FOLEY AND LARDNER
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007

EXAMINER
ZACHARIA, RAMSEY E

ART UNIT	PAPER NUMBER
1773	

17

DATE MAILED: 06/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application N .	Applicant(s)	
	09/989,913	BUCKLEY, THERESA M.	
	Examin r	Art Unit	
	Ramsey Zacharia	1773	

-- The MAILING DATE of this c mmunication appears on the cover sheet with the correspondence address --

Peri d for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 April 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *24-70* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *24-70* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *16* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10 April 2003 has been entered.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

3. Claims 69 and 70 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 69 recites the limitation "the garment" in line 4. There is insufficient antecedent basis for this limitation in the claim. Note that claim 69 is directed to an article of bedding.

5. Claim 70 recites the limitation "[t]he garment" in line 1. There is insufficient antecedent basis for this limitation in the claim. Note that claim 70 depends from claim 69 which is directed to an article of bedding.

Claim Rejections - 35 USC § 102

6. Claims 24-26, 28-30, 34, 35, 38, 39, 41, 43-46, 50, 52-54, and 56-60 are rejected under 35 U.S.C. 102(b) as being anticipated by Bryant et al. (U.S. Patent 4,756,958).

Bryant et al. teach a fabric comprising a fiber having microcapsules encapsulating one or more phase change materials (column 2, lines 25-42). The phase change material may be a paraffin hydrocarbon exhibiting a solid-liquid transition or a plastic crystal exhibiting a solid-solid transition at or below room temperature (column 3, lines 23-55). The fabric may be formed into items of clothing (column 4, lines 37-42). Bryant et al. disclose phase change materials having a transition temperature of from -5.5 to 61.4 °C, i.e. about 22 to 142 °F (column 3, lines 40-55). Specific examples of transition temperatures including 10 °C, 18.2 °C, and 22 °C, which are about 50, 64, and 72 °F, respectively. The fabric can be used to make gloves, shoes, and environmental suits (column 4, lines 14-42).

Regarding the limitation that the article is for metabolic cooling and for insulation of a user in a cold ambient environment below a phase transition temperature of a thermal storage material, this is not a material limitation but rather an intended use of the article. That is, the article is intended to be used for metabolic cooling and insulation in a cold ambient environment. It has been held that a recitation with respect to the manner in which a claimed product is intended to be employed does not differentiate the claimed product from a prior art product satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987). The article of Bryant et al. meets all the structural limitations of claims 24-26, 28-30, 34, 35, 38-41, 43-46, 50, 52-54, and 56-60, therefore the rejection is valid.

Likewise the limitation in claims 24, 44, and 59 that the thermal mass is at least equal to the difference between the heat loss from the thermal storage material to the ambient environment and the metabolic heat absorbed is not a structural limitation but rather a limitation dependent on the intended use of the article since the amount of heat lost to the ambient environment is a function of ambient temperature and the amount of metabolic heat absorbed is a function of the metabolic temperature. Therefore, the thermal mass required is a function of the intended use of the article (the temperature at which the article is to be used) and not an intrinsic structural limitation.

Moreover, the limitation in claim 50 that the thermal mass is sufficient to partially decouple heat transfer between the ambient environment and the thermal capacitor and metabolic heat absorbed by the thermal capacitor is also dependent on the amount of heat transfer between the capacitor and the ambient environment and the body and the capacitor. Since these are functions of the ambient and body temperatures, respectively, this thermal mass is also a function of the intended use of the article.

Furthermore, the limitation in claims 50 and 56 that the thermal mass is sufficient to maintain the phase change material in a partially solid and partially liquid state for a specified duration when the thermal capacitor is exposed to an ambient environment below the actual phase transition temperature of the phase change material on one side and metabolic heat on another side is also dependent on the rate of heat flow between the body and the capacitor and the rate of heat flow between the capacitor and the ambient environment. Since these rates are functions of the body and ambient temperatures, respectively, the rates are a function of the

intended use of the article. Thus, the thermal mass is also a function of the intended use of the article.

7. Claims 24-27, 29, 30, 31, 34-36, 38, 44-46, 50-52, 54, and 56-58 are rejected under 35 U.S.C. 102(e) as being anticipated by Salyer (U.S. Patent 5,106,520) as evidenced by Bruemmer et al. (U.S. Patent 5,176,672).

Salyer teaches free flowing particles of silica with phase change material absorbed into the silica that may be incorporated into garments (column 2, lines 10-27). The garment may be a jacket (Figure 6). Alkyl hydrocarbons having a chain length of C_{14} and greater are the preferred phase change material, these exhibit a solid-liquid transition (column 4, lines 11-20). Blends of these phase change materials may be used (column 35-44). The transition temperatures of these materials range from 0 to 33 °C, i.e. about 32 to 91 °F (column 5, lines 35-44). In garment applications, the silica particles are encapsulated in pouches (Figure 7 and column 8, lines 49-59). Silica is taken to be a superabsorbent material since Bruemmer et al. discloses that silica is considered a superabsorbent material (column 8, lines 30-33). Insulation may be added to minimize heat flow between the phase change material and the environment (column 9, line 37-column 10, lines 4). Regarding claims 32 and 51, this insulation reads on the insulative layer and the liquid impervious enclosure facing the wearer reads on the thermal control layer since the insulative layer will inherently have a higher insulative value than the liquid impervious layer because it is designed to minimize heat flow to the environment while the garment as a whole is designed to permit heat flow between the phase change material and the wearer.

See the discussion above in paragraph 6 regarding the thermal mass limitations.

Claim Rejections - 35 USC § 103

8. Claims 36, 37, 40, 42, 47-49, 55, 61-67, and 69-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bryant et al. (U.S. Patent 4,756,958).

Bryant et al. teach a fabric having microcapsules encapsulating one or more phase change materials as outlined above.

Bryant et al. do not teach using the fabric to form liner, wet suit, or ski boot. However, the fabric may be formed into items of clothing, such as gloves or shoes (column 4, lines 37-42). Furthermore, Bryant et al. are silent with respect to the thermal loading of phase change material in their fabric.

Liners (such as socks), wet suits, and ski boats are all items of clothing. Since the fabric of Bryant et al. is explicitly taught as suitable for making clothing in general, it would have been obvious for one of ordinary skill to make any article of clothing.

Regarding claims 47-49, 55, 61-64, and 69-70, the thermal loading of phase change material in the article is a results effective variable that directly affects the thermal performance of the article. It would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the amount of phase change material used in the fabric of Bryant et al., since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2nd 272, 205 USPQ 215 (CCPA 1980).

Regarding the product-by-process limitations of claims 65-67, when the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claim in a product-by-process claim, the burden is on the applicant to present

evidence from which the examiner could reasonably conclude that the claimed product differs in kind from those of the prior art. *In re Brown*, 459 F. 2d 531, 173 USPQ 685 (CCPA 1972); *In re Fessman*, 489 F. 2d 742, 180 USPQ 324 (CCPA 1974). This burden is NOT discharged solely because the product was derived from a process not known to the prior art. *In re Fessman*, 489 F. 2d 742, 180 USPQ 324 (CCPA 1974). Furthermore, the determination of patentability for a product-by-process claim is based on the product itself and not on the method of production. If the product in the product-by-process claim is the same or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985) and MPEP § 2113. In this case, the final product of Bryant et al. appears to be the same as that of the invention as claimed for the reasons put forth above. Therefore, the burden is on the applicant to conclusively demonstrate that the product-by-process invention as claimed differs from that of the prior art.

Therefore, the inventions of claims 36, 37, 40, 42, 47-49, 55, 61-67, and 69-70 would have been obvious to one of ordinary skill in the art at the time the inventions were made.

9. Claims 37, 39-43, 47-49, 53, 55, 59-67, and 69-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Salyer (U.S. Patent 5,106,520).

Salyer teach a garment comprising phase change material absorbed into silica particles as outlined above.

Salyer does not teach using the fabric to form a wet suit, ski boot, shoe, or sock. Furthermore, Salyer is silent with respect to the thermal loading of phase change material in the garment.

Liners (such as socks), wet suits, and ski boats are all items of clothing. Since the article of Salyer is explicitly taught as suitable for making garments in general, it would have been obvious for one of ordinary skill to make any article of garment.

Regarding claims 47-49, 55, 61-64, and 69-70, the thermal loading of phase change material in the article is a results effective variable that directly affects the thermal performance of the article. It would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the amount of phase change material used in the garment of Salyer, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2nd 272, 205 USPQ 215 (CCPA 1980).

Regarding the product-by-process limitations of claims 65-67, when the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claim in a product-by-process claim, the burden is on the applicant to present evidence from which the examiner could reasonably conclude that the claimed product differs in kind from those of the prior art. *In re Brown*, 459 F. 2d 531, 173 USPQ 685 (CCPA 1972); *In re Fessman*, 489 F. 2d 742, 180 USPQ 324 (CCPA 1974). This burden is NOT discharged solely because the product was derived from a process not known to the prior art. *In re Fessman*, 489 F. 2d 742, 180 USPQ 324 (CCPA 1974). Furthermore, the determination of patentability for a product-by-process claim is based on the product itself and not on the method of production. If the product in the product-by-process claim is the same or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985) and MPEP § 2113. In this case, the final product of Bryant et al. appears to be the same as that of the invention as claimed for the reasons put

forth above. Therefore, the burden is on the applicant to conclusively demonstrate that the product-by-process invention as claimed differs from that of the prior art.

Therefore, the inventions of claims 37, 39-43, 47-49, 53, 55, 59-67, and 69-70 would have been obvious to one of ordinary skill in the art at the time the inventions were made.

10. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bryant et al. (U.S. Patent 4,756,958) in view of Ellsworth (U.S. Patent 3,969,551).

Bryant et al. teach a fabric for making garments that comprises a phase change material within a fiber having all the limitations of claim 31, as outlined above, except for specifying that the fiber is cellulose. Bryant et al. do teach that the fiber may be polyester, nylon (i.e. polyamide), or acrylic.

Ellsworth discloses that textiles used in making apparel is commonly made from a variety of fibers including cellulosic fibers as well as polyamide, polyester, and polyacrylic fibers (column 2, lines 55-64).

Ellsworth shows that polyester, nylon, acrylic, and cellulosic fibers known in the art as equivalent materials for forming fabrics to be used in the garment industry. Therefore, because these materials were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute cellulosic fibers for the polyester, nylon, or acrylic fibers of Bryant et al.

Therefore, the invention of claim 31 would have been obvious to one of ordinary skill in the art at the time the invention was made.

11. Claims 33 and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bryant et al. (U.S. Patent 4,756,958) in view of Moretz et al. (U.S. Patent 5,217,782).

Bryant et al. teach a garment that meets all the limitations of claims 33 and 68, as outlined above, except for the presence of a wicking layer and semi-permeable layer that is permeable to water vapor but impermeable to liquid water.

Moretz et al. teach a moisture management panel for incorporation into garments to prevent the garment from chafing and irritating the wearer and minimize conditions conductive to bacteria, fungus, and yeast growth (column 1, lines 7-27). The panel comprises a hydrophilic transport layer, i.e. a wicking layer (column 4, lines 10-17). The panel also comprises a an outer layer that is treated so as to permit evaporation (i.e. permeable to water vapor) but still prevent liquid penetration (column 4, lines 38-43).

One of ordinary skill in the art would be motivated to incorporate the moisture management panel of Moretz et al. into the garment of Bryant et al. to prevent the garment from chafing and irritating the wearer and minimize conditions conductive to bacteria, fungus, and yeast growth.

Therefore, the inventions of claims 33 and 68 would have been obvious to one of ordinary skill in the art at the time the inventions were made.

Response to Arguments

12. Applicant's arguments filed 10 April 2003 have been fully considered but they are not persuasive.

Regarding Bryant et al. and Salyer references, the applicant argues that the claims recite structural limitations that are not taught or suggested by the references.

This is not persuasive for the following reasons. The limitations recited in the claims that the applicant alleges are not taught or suggested by Bryant et al. or Salyer are directed to thermal masses required to achieve a specific result during the use of the article, e.g. at least equal to the difference between the heat lost to the environment and the metabolic heat absorbed for at least one hour. However, as outlined above in paragraph 6, these limitations all depend on the ambient and metabolic temperatures. Thus, they are not structural limitations of the article, but rather they depend on the conditions at which the article is to be used. Presumably any thermal mass will be at least equal to the difference between the heat lost to the environment and the metabolic heat absorbed if the metabolic temperature is high enough over the phase transition temperature and/or the ambient temperature is close enough to the phase transition temperature.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ramsey Zacharia whose telephone number is (703) 305-0503. The examiner can normally be reached on Monday through Friday from 9 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau, can be reached on (703) 308-2367. The fax phone number for the

organization where this application or proceeding is assigned is (703) 872-9310 for non after-final correspondences and (703) 872-9311 for after-final correspondences.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Ramsey Zacharia
Primary Examiner
Technology Center 1700
6/24/03